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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,658	12/17/2001	Kwang-Leong Choy	674505.2003	3227

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EXAMINER
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PARKER, FREDERICK JOHN

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 07/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/024,658

Applicant(s)

CHOY ET AL.

Examiner

Frederick J. Parker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2005.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte* Quayle, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 37-72 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 37-72 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6/23/05.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/23/05 has been entered.

### *Double Patenting*

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 37-72 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-37 of U.S. Patent No. 6331330 (US330) in view of EP0252755 (col. 3, 44-58). Instant claim 37 varies from US330 only in that it recites a Ph modifier which is an obvious formulation constituent permitted by claim 37, and claim 37 cites evaporation and decomposition which inherently occurs at the temperatures necessary to deposit the material in US330. Pressure feeding is an obvious variation as set forth in the similar

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process of EP0252755 to provide coating solution to the outlet. Similar remarks are germane to independent claims 70-72. Claims 38-69 of instant application are the same/ equivalent to claims 2-37 of US330, respectively.

4. Claims 37,39-48 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5,18,23-27 of U.S. Patent No. 6296910 (US910) in view of EP0252755. Instant claim 37 is the same as that of claim 1 of US910 except it cites pressure feeding which is an obvious variation as set forth in the similar process of EP0252755 to provide coating solution to the outlet. Material solution of US910 encompasses a precursor and solvent (claim 10); the relationship of temperature between substrate and outlet are equivalent, albeit reversed, in instant claim 37 and claim 1 of US910. The progressive heating step of US 910 is permitted by the instant claims. Instant claims 39-48 are the same/ equivalent to claims 2-5,18,23-27 of US910, respectively

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 37-40,42-48,58,68-70 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim et al US 5,344,676.

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Kim et al teaches a method for applying nanodrops to a substrate to form a coating film or nanoparticles (= powder, col. 3, 23). A polymeric sol-type precursor material 9 comprises a decomposable base material with a solvent. The sprayed liquid droplets are electrostatically charged with a negative or positive polarity, and an electric field generated between the charged droplets and electrode needle 14 as described provides a corona spray because the electrons are produced by the electrode to flow and charge the droplets. The entire apparatus is contained within chamber 22 per claim 33, which may contain an inert or reactive gas (clm 58). The target area is heated by heater 34 to promote reactions and specific heating temperatures would have been dependant upon the decomposition temperature of any precursor in order to form the desired coating material. There would have inherently been a decrease in temperature as a function of distance from the heated substrate towards the outlet. Solvent evaporation and precursor decomposition would have inherently occurred as atomized particles approach the substrate to satisfy the requirement of forming a coating film or nanoparticles. Coating solution is transported from supply 2 to the spray outlet using capillary tube device 10 which together with gravity forms at least some degree of pressure on the material solution to contribute towards "feeding", and accelerated/ focused by an electric field or magnetic field (col. 3, 63 to col. 4, 2). Rotating the target relative to the sprayed nanodroplets to produce uniform deposition is taught on col. 4, 12-16. As the atomized droplets approach the heated substrate, and solvent is evaporated and/or precursor reaction occurs, the solution concentration/composition would be changed per claim 40.

2. Claim 72 is rejected under 35 U.S.C. 102(b) as being anticipated by Spiller US 3754975.

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Spiller teaches a method of coatings a substrate by supplying a coating solution under pressure comprising a solvent and decomposable metal salt ("precursor compound") which is sprayed (inherently involves "pressure feeding") through a nozzle of a spray head onto the heated substrate to decompose the solution to form a coating, the heated substrate providing an increase in temperature from the spray outlet towards the heated substrate (and therefore inherently also a decreasing temperature gradient from the heated substrate towards the nozzle). The sprayed particles adhere to the substrate by utilization of an electrostatic field between particles and substrate, the particle charging as described on col. 8, Example, etc forming an atomized corona spray of droplets.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 41,49,55-57,67,71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al.

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Kim et al is cited for the same reasons previously discussed, which are incorporated herein.

While varying electric field polarity of claim 41 is not cited, it is the Examiner's position that doing so is well-known in the electrostatic coating arts to allow formation of thicker coatings by eliminating electrostatic repulsion between layers, to form overlying layers which would have been expected to form in the thickness ranges of claim 67. Per claim 49, maintaining the electrostatic field during cooling of the applied coat would have been an obvious variation to assure adherence of the coat to the substrate. The voltage range of claim 55 overlaps the KV range of Kim et al on col. 3, 56. The subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made if the overlapping portion of the KV range disclosed by the reference were selected because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Wortheim* 191 USPQ 90. While the temperature ranges of claims 56-57 are not cited, it is the Examiner's position that since the temperature of the substrate is dependant upon the solvent and precursor material applied, the temperature gradient would have been dependant upon such factors, as well as the ambient temperature, temperature of surrounding gas, etc, such that the gradient temperatures would have been obvious variations based upon the obvious processes parameters apparent to the skilled artisan.

6. Claims 50-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al in view of Clark US 4921731 or Chivukala US 6066581.

Kim et al is cited for the same reasons previously discussed, which are incorporated herein.

PH modifying catalysts are not disclosed.

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Clark et al teaches a method for forming sol coatings onto substrates in which a precursor solution is formed using organ metallic compounds such as metal alkoxides, ethoxides, methoxides, etc; orthosilicates (encompassing or reasonably suggesting polymeric organosiloxanes); and mixtures thereof in an aqueous or water-organic solvent mixture, in which the pH is necessarily adjusted by use of a suitable acid , inorganic salt or base (col. 7, lines 6-15; col. 7, lines 21-41). The use of such pH agents causes hydrolysis and peptization to promote stability of the sol particles formed. Alternatively col. 2, 49-59 of Chivukula et al teaches hydrolysis and polymerization is controlled by pH/ presence of acid or base catalysts in similar precursor systems. Hence, one of ordinary skill would have recognized the importance of adjusting pH using the pH agents of Clark et al or Chivukula et al a sol-based coating process, including that of Kim et al, to derive the recognized benefits of hydrolysis and stabilization of the sol particles formed.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the electrostatic spray process of Kim et al by incorporating the teachings regarding pH agents of Clark et al or Chivukula et al to attain the recognized benefits of hydrolysis and peptization to promote stability of the sol particles formed in the electrostatic spray coating process.

7. The prior art does not teach nor suggest the specific composition formulations of claims 59-66; those claims are objected to for depending from a rejected base claim.

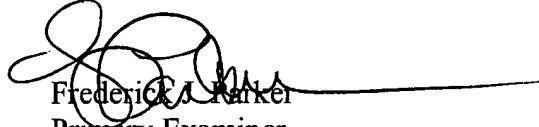


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick J. Parker whose telephone number is 571/ 272-1426. The examiner can normally be reached on Mon-Thur. 6:15am -3:45pm, and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571/272-1423. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Frederick J. Parker  
Primary Examiner  
Art Unit 1762

fjp